

.Attachment A

25X1A

CLASSIFICATION	Section of the section of
	I II

COUNTRY Soviet Union REPORT	NO

TOPIC	Carbide	-and	Rubber	Industry	in	YEREVAN	(Armenian	SSR)
-	<del></del>	<del>,</del>		, in				

EVALUATION see	below PL	ACE OBTAINED	
DATE OF CONTENT	see below		
DATE OBTAINED	see below	DATE PREPARED	
REFERENCES			
PAGES	ENCLOSURES	( No. & Type)	i

25X1X

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(40°11' N/ 44°30' E) a. The YEREVAN/Rubber Plant covers an area of about 1 x 0.8 miles. It is located at the southwestern outskirts of the town. Spur tracks lead to the wide gauge, single-track YEREVAN-LTHINAKAN(400 48' N/43058' E)railroad line.

b. In the southwestern corner of the plant are 22 oil tanks each having a Approved For Release 2001/12/10: CIA-RDP83-00415R009200030002-4

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volumetric capacity of 75 cubic meters.

c. 9 "rubber furnaces were lined in about the center of the plant.

Sach furnace was connected with a workshop.

- d. According to information of indigenous workmen the plant produced only crude rubber. It was shutdown at the end of the observation time because the entire old machinery of the plant was being replaced by dismantled German material.
- e. In normal time the plant is said to employ 1,200 workmen working in three 8-hour shifts.
- f. The "Polyvinyl -Acetat" Plant is under construction southwest of the Rubber Plant. It covers an area of 1,600 x 500 feet. In the southeastern corner of this plant are four partly underground oil tanks each of about 100 cubic meters volumetric capacity.

  There were 12 workshops ,each about 160 x 160 feet, on the area of this plant. Hydraulic presses were being set up in these workshow A total of 250 such presses will allegedly be put into operation.

  This plant immakes has also a spur track to the main railroad line.

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a. The "Kautschuk Zavod"Rubber Plant covers an area of about 3,300 x 2,300 feet. It is located in the south of YEREVAN in the suburb of KAUTSCHUK about 1,600 feet east of the YEREVAN LENINAKAN.

About 300 feet northwest of the plant is a cable factory and about 600 feet southwest is a PINTERNAL plexiglass factory.

- b. Construction of the rubber apparently started in wartime. No additional structures were built by the end of the observation time.

  Some finishing building work was done only in the carbide department in 1946-1947. Not all workshop buildings are built in stone. 'here are still a great number of makeshift structures. The locksmith's shop of the plant, for instance, is housed in one of these structures. c. Source mentioned INIXX following installations:
- (1) Power station, a tall stone building with 30 foot high highin lightning conductors. (This is possibly a transformer station according to the description of source.)
- (2) A very large boiler house consisting of iron structures lined with brickwork.
- (3) A workshop building,650 x 65 feet, and 65 feet high with vehtilation stacks. Part of the carbide needed by the rubber plant is produced in this workshop.
- (4) 6 about 50 foot high conical shaftxkithm cupola furnaces ("carbide furnaces" according to designation of source).
  - (5) A covered dump for coal and coke.
- (6) A large reservoir masse in which the pur processed carbice mud was soaked. This product is used for building purposes.
- d. Power is supplied to the plant through a long-distance line. Approved For Release 2001/12/10: CIA-RDP83-00415R009200030002-4

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Hard coal, coke-, salt- and other not identified shipments came by rail.

- e. Synthetic rubber was produced. There was also a small-scale tire production.

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- a. Spur tracks lead from the YEREVAN railroad station to

  the Synthetic Rubber Plant located 2 miles south of the railroad station,

  Rubber Plant

  to the Cable Rubber Works located 1,000 feet north of the Synthetic

  to the Tire Plant located between the two above-mentioned plants

  and to the Bakelite Factory under construction about 3,300 feet southwes

  of the Rubber Plant.
  - b. Rubber Plan was enlarged from 1945 until early i 1948.
  - c. The plant has four departments which source designated "hydrogenatic installations." Source only remembers the ramified "non insulated" pipe c system passing through all buildings. The pipe lines were covered with thick ice layers also in summer and watchlike thermometers showed

temperatures ranging from 2x minus 20 to 30 degrees centigrade.

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- d. Spongy ,xaka yellowish crude rubber was produced in two workshops which Rwissassasprentiated were off limits to PW's.
- f. The plant has a high boiler house with one smoke stack. The boiler house is fired with coal.
- g. Rock salt in was powderized in buildings about 330 x 65 feet. The salt was then dissolved in water in containers with a diameter of about 100 feet. The brine was pumped into containers and pipes.

  Further processing of the salt is not known to source.
- h. The daily carbide consumption of each generator was 36 tons. The produced gas was conducted through underground pipe lines to four gasometers each mithaaxdiameter 60 to 65 feet in diameter and

33 feet bigh.

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- i. A building about 330 x 330 feet was constructed near the Rubber

  Plant in 1946-1947. It was a plant where tires for motorcycles, for passenger cars and trucks were produced.
- j. Etill annother plant was under construction in the vicinity of the Rubber Plant during the time of observation. This plant was scheduled to produce plastics ("bakelite" according to the Russian designation).

  k. For layout sketch see Annex 1.

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- a. The Rubber Plant is about 2,600 feet south of the outskirts of YEREWAN. There were seven workshop buildings of various sizes.
- b. In one workshop barksing, about 500 x EE 160 feet, there were three machines rising through all three stories of this building. A yellow, plastic mass was produced in this workshop.
- c. Almost black rubber plates, 20 x 40 inches, 40 x 40 inches and 12 x 40 inches with thickness ranging from 30 to 60 mm (?) were produced in another workshop.
- incoming shipments of d. Source remembers following/raw materials: XXXX

Limes

- a black, liquid mass coming in wooden tubs;
- a yellow, viscous mass coming in iron barrels.
- e. Outgoing shipments: 15 to 20 daily carloads in the direction of

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TBILISI. Amount and kind of shipments are not known.

- f. The work force is estimated at 2,500 including about 800 PW's. Work was done in a three shift schedule.
- g. When the plant was enlarged between 1942 and 1947 apper German material was apparently also used. Source observed on one box DELITSCH as
  - h. Immediately at the outskirts of YEREVAN northwest of the Rubber Plant there was a plant consisting of six workshop building of variable sizes. It was a plant for chemical warfare agents according to the designation of source. Some small-scale building activities were still under way at the time of observation.
- i. At the time of observation another plant was under construction about 5,000 feet south of the plant mentioned in i) and southwest of the Rubber Plant. Production of this plant was not known to source. Spurce observed the installation of two high presses in one building. The presses were heavily rusted and allegedly originated from Western Germany. Boxes with machine tools, partly of Canadian origin and marked with TORONTO, were it one storage place.

25X1X 5.

a. Part of the  $R_{\rm ubber-}$  and Carbide Plant at the southwestern outskirts of YEREVAN was still under construction at the time of observation.

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- b. In the southern part of the plant there were two batteries of six boiler-shaped oil tanks each. The tanks had a volumetric capacity of 50 tons each and were sunk into the ground.
- c. A department equipped with hydraulic presses miradax already produce crude rubber though the war workshop building was not yet completed.
- d. The workshop buildings used for carbide production were equipped with modern American machinery.
- e. Two daily carloads of finished rubber goods were shipped at the time of observation.
- f. Two daily carloads of rock salt was unloaded the use of which source does not know.

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- an older plant installation was renovated and converted into a plant face for the production of plastics or some similar production. A new cable works was considered an especially modern plant. It was built from the material of a completely dismantled German cable works in BERLIN-SIEMENSSTADT. The cable works was miss already in operation at the time of observation and source noted that many heavy underground cables were produced.
- b. In addition to these plants installations of the MEISSEN
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put into operation already in 1947. They The construction was allegedly copied exactly from the original. Also the kaolin materia processed in YEREVAN are said to resemble closely those used in MEISSEN.

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- a. Source believes that the YEREVAN Rubber Plant was built during th war. It was already in operation early in 1947. The plant located at the southern outskirts of YEREVAN covers an area of about 1 x 1 mi b. Source describes following plant installations:
- (1) The very high boiler house has several smoke stacks and is equipped with three steam boilers(one oil-fired and two coal-fired)

  The fuel oil is pumped intention through injection nozzles into the oil-fired gx furnace, while the other two furnaces have intention traveling grates automatically supplied with coal by chutes. The chutes are fed by means of an inclined conveying machinery.
- n one longitudinal building. These furnaces reminded source of lime kilns.
- (3) There/four furnaces in another building. Three furnaces were in operation at a time. Heating of the furnaces was done by

cross section coal electrodes. The furnaces had a sizemmissiance of about 3 x 3 fe Approved For Release 2001/12/10: CIA-RDP83-00415R009200030002-4

and were 6.5 feet long. (Horizontal position) The furnaces were charged from the top, Rawxmaterialexeamexbxxxxii where raw materials came in electronal railroad dump cars.

- (4) In the adjacent building equipped with lifting appliances and travelin crabs were grinding mills for crushing the carbide produced in the above-mentioned furnaces.
- There were still some workshop buildings in the plant the use of which source did not know.
- (6) ource did not observe a power station. He saw only a high tension line coming from an unknown direction into the plant.
- c. Following shipments came by rail: hard coal, coke and carbide in drums.

  Part of the carbide was apparently submitted to a thermal treatment the us of which source does not know.

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3.

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- a. Power was supplied to the YEREVAN Rubber Plant by a special power station equipped with two Diesel installations.
- b. Following raw materials were unloaded in the plant: lime, wood, coal and apparently carbide in tin containers. Also an unknown liquid was unloaded from tank cars and deminishmentand carboys as well as earthenware

containers were unloaded from railroad cars, in addition to other am Approved For Release 2001/12/10: CIA-RDP83-00415R009200030002-4

material which source could not identify.

plates
c. The loading boxes source observed exempts right of a dull lustre
about 20 x 8 inches and 20 mm thick. Chips of these plates were
used by workmen for lighting stove fires. They burned with a very
bright flame.

d. PW's employed in the plant were replaced every month. Recreational periods alternated with work periods. Increased milk-, fat-and bread rations were allocated. Many workmen wore protective asbestes clothing during work. Source did not observe any gas mask. The xegz vegetation around the plant had changed into brown color. During close weather the waste gases of the plant caused respirator trouble.

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a. Baw material shipments came to the YEREVAN Rubber Plant from ARARAT

KIROVAKAN and from the quarries at the Ararat Mountain. Part of these materials resembles carbide.

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Summary and Comment:

## 1. Location and history:

The enlarged Rubber Combine now partly equipped with new installations arose from the prewar rubber plant "KIROV, SK. Sowpren No.1". This plan was for a long time an experimental installation for the production of synthetic rubber on the basis of acetylene produced from calcium carbid. However, normal production had started already before the war. It was to only plant of this kind in the Soviet nion. All other rubber syntheses in the Soviet Union are based exclusively on the potato spirit or other spirit varieties according to the so-called Divinylprocess of LEBEDYEV. However, this process is not only very costly, but also uses important substances required for the food supply. Therefore, since years the greatest efforts were made to develop exkinant rubber production

from other basic materials such as carbide, crude oil and natural gas.

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nowever until the war this problem could not be solved satisfactorily and it seems that certain progress could only be reached after vigorous American aid had started and dismantled German material had been installed.

the development of the VEREVAN Plant appears to have progressed but slowly. PW's were assigned to improve the old plant not until the first quarter of 1946. All old and important apparatuses were removed to be replaced by better ones either shipped from Germany or from the USA and Canada.

It was not determined why the old installations did not work as desired, as the acetylene-based productio process was also taken up by the American Firm Du Pont De Nemours (Rubber Chemicals Division WILMINGTON 28, Delawars.) Carbide production is said to have been a special bottleneck in former years.

The largest carbide factory of the Soviet Union was built in VEREVAL simultaneously with the plant for synthetic rubber or perhaps even earlier. The first completed plant section with an annual sagarity capacity of 20,000 tons of calcium carbide started operation in 1936. Later the output was inchestively planned to be tripled. The theoretical annual capacity was meant to reach at 50,000 to 60,000 tons after the end of building operations in 1941.

b. Plant installations: According to available information the

YEREVAN HARXISIINKIHKANIKANIKANIKANIKANIKA Rubber Combine had Approved For Release 2001/12/10: CIA-RDP83-00415R009200030002-4

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following installations before its reconstruction:

as well as of two gasometers for the storage of gases.

a. Carbide department. It consisted of about/buildings, mostly ironconcrete structures, a battery of 8 lime kilns with grinding mills,
and of accessory
an installation of 6 carbide furnaces with carbide -crushers.

b. Acetylene department. Two installations of acetylene generators wer
scheduled to produce 15,000 tons of acetylene annually. The department consisted of 4 to 5 large and widdle-sized buildings

c. A department which should produce 12,000 tons of Monovinylacetylen annually.

- department for the d. The zim chloralkali-electrolysis and the further processing of chloric gas was housed in two buildings. The capacity of this department was planned to 10,000 tons.
- e. There were also installations for the production of chlorbenzol and chlororpren( "Sovpren" according to the Soviet designation).
- f. The rubber-processing department comprised a great number of buildings. The production of this department aixs included tires for vehicles.
- g. In addition to these important production departments there wer still installations for the production of sulphuric acid and nitrogen almost Theproduced nitrogen was probably calcium cyanamide which is/necessarily produced from inferior carbide charges during carbide production.— Older reports also mention ammonia and liquid oxygen.

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h. In addition to these workshop buildings there were a number of and buildings housing the administration, laboratories, first aid station. Despite the long construction time—only the most important departments were apparently accommodated in stone buildings while a great mumber of secondary installations and workshops were housed in makeshift structures.

The transfer entire plant covered an area of about 123,000 square meters, the built-up area was about 50,000 square meters.

Apparatuses of important departments were removed and replaced by new ones since 1946. This plant conversion lasted for about two years before partial production could start.

Only some new buildings were built. Therefore the layout of the Combine is almost unchanged as compared to its old outline. This fact may be important for the evaluation of old aerial photographs. The construction of industfial and residential buildings is under way online the surroundings of the Combine.

The information supplied in these reports does not give a comprehensive picture on the \*\*maximum mills\*\* details of the new installations.

There is no doubt that the lime-burning department with its 6 to 8 cupola furnaces, the carbide department with its 4 electric arc furnaces the grinding mills, the chlorine department, the boiler house and the

power station have been provided with new machinery and equipment. Approved For Release 2001/12/10: CIA-RDP83-00415R009200030002-4

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However, the arrangement is generally the same as it was before the **EMEXECUTION**. As six carbidefurnaces were operated **PXEX**! previously against only four at the present time the output of the carbide furnaces has apparently increased.

The boiler house is equipped with modern oil- and coal firing installations. The power station with its two Diesel engines can only be

powerconsidered an emergency installation used during breakdown periods.

Its transformers serve to convert the current supplied by the KANAKIR

(40°13' N/ 44°32' E) Power Flant.

The buna-producing synthetic department as well as the synthetic department working on a crude oil basis are quite recent installation. These departments have certainly been housed in already existing workshop buildings. Also the appatuses gaits which source designate "hydrogenation installations" are part of these departments.

The information on a plant design alternately called Plexiglass -,

Polyvinylacetat - HHEXEXENSIANS or Bakelite Plant is somewhat vague.

The same applies to an installation where some very large hydraulic presses based on four pillars have been put installation and where still additional presses are scheduled to INNIXIANS be set up. The possibilities for the production of plastics on the basis of produced vinyl compounds and acetylene derivatives increases are so variable in the YERFEVAN Combine that it is impossible the identify

HAN However, it is certainly not bakelite.— Bituminous crude oil residues were doubtlessly processed with produced artificial resin possible with admixtures of natural resin.— These products are processed into plastics on the spot which can be inferred from the abovementioned presses. INSERNAMENTAL According to the description these presses resemble those manufactured by the Firm Becker & Van Huellen in KREFELD.

So far, there is no reason to assume that chemical warfare agents are produced in the Rubber Combine or in a nearby plant. The processe baw materials such acetylene, clorine etc. may suggest such a production in an emergency. However, so far there are no indications that such a production was started. There may have been a small-scal production of cyanides and arsenic compounds during the war, but this production has certainly been abandoned and since, long. There are large installations in DZHULFA(38°54' N/45°38' E), BAKU and SUMGAIT which are much better suited for the production of chemical warfare agents.

Originally it was planned to start a large-scale rubber ware production of the scale rubber was planned to start a large-scale rubber was production of the scale rubber was producted by the scal

3. Production. According to available information following items are produced in the Combine: carbide, crude rubber, chlorine, plastics,

oxygen, probably calcium cyanamide, chlorbenzol, sulphuric acid, Approved For Release 2001/12/10: CIA-RDP83-00415R009200030002-4

- as well as paints and varnishes. There may still be some additional products. No information is available on the actual capacity of the plant.
- 4. Raw materials. The most important basic raw materials for the finite of TEREVAN Combine are coal, limestone, rock salt and crude oil. The raw material sources are: the Grusin Mines of TKVIEULI(42°22' N/42°59' E) and TKVARCHELI(42°51' N/41°41' E) for coal; the quarries of DAVALU (39°50' N/44°52' E) at the ARARAT railroad station for limestone; the surroundings of NAKHICHEVAN for rock salt. Crude oil and crude oil residues are supplied from the BAKU area.
- 5. The indications on the work force vary between 2,000 and 3,000. The figure may probably be still higher.

## Map sketch of the YEREVAN Rubber Combine Approved For Release 2001/12/10: CIA-RDP83-00415R009200030002-4

- A Cable works
- B Tire plant
- C "Sovpren No.1 "Rubber Plant
  - 1. Administration building
  - 2. First aid station
  - 3. Depot
  - 4. Cooling installation

  - 6. Boiler house with smoke stack
  - 7. TREXXEEXEE Two rubber-producing workshops
  - 8. Hydrogentaidn installation(? according to designation of source
  - 9/ Probably chloralkali-electrolysis
- 10. Acetylene generators
- 11 Gasometer
- D Plant producing plastics

Map sketch of the YEREYAN Rubber Combine
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- A 1 Administration bailding
  - 2 Depot for spare parts
  - 3 Depot for building materials
  - 4 Carbide-crushing installation
  - 5 Carbide furnaces
  - 6 Lime kilns
  - 7 Laoding ramp
  - 8 Inclined conveying machinery
  - 9 Boiler house
  - 10 and 11 Depots
- B 1 Underground pipeline
  - 2 Excavation
  - 3 nderground tank
  - 4 PW Camp No.7115/9
- ater hasin

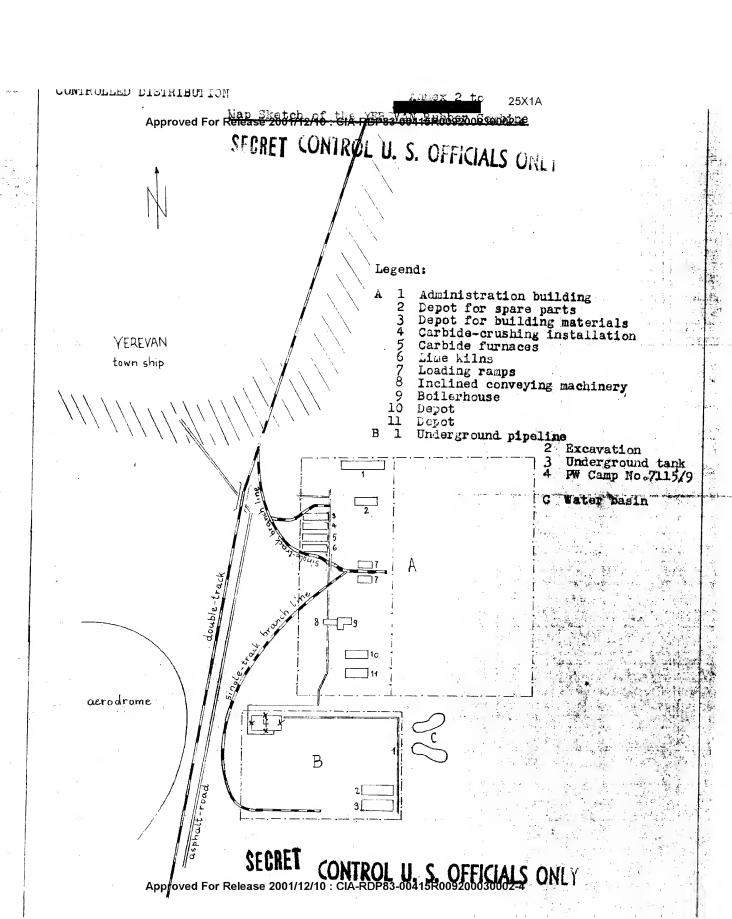
- A dubber Plant
- 1 Coal dump
- 2 Limestone dump
- 3 Lime kilns
- 4 Lime crushers
- 5 Production of electrodes
- 6 Barrel factory and barrel depot
- 7 Depot of materials
- 8 Workshop
- 9 Battery charging station
- 10 Transformer station and power station
- ll Carbide processing
- 12 Carbide furnaces
- 13 Depot for spare parts
- 14 Carbide packing
- 15 Carbide depot
- 16 Rubber depot
- 17 Clothing depot
- 18 Administration
- 19 First aid station
- 20 Plant laboratory
- 21 Rubber dispatch department
- 22 Depot for building materials
- 23 woodworking department
- 24 Boiler manus house
- 25 Coal processing
- 26 Production of paints and lacquers
- 27 Probably sulphuric acid tanks
- 28 roduction of sulphuric acid
- 29 Cloralkali electrolysis
- 30 Chloropren department
- 31 Polymerization department

- 32. Crude rubber production
- 33. Froduction of finished rubber wares
- 34. Rubber test installations
- 35. Probably cooling plant
- 36. Froduction of oxygen
- 37. Rubber depot Purification
- 38. CINHING of acetylene
- 39. Production of acetylene
- 40. Tanks for acetylene gas
- 41. Chlorine department
- 42. roduction of chlorbenzol
- 43. Settling tub for carbide mud
- 44. Crude oil dem dump
- 45. Fuel, possibly also crude oil dump
- 46. Nitrogen installation
- B. actory producing plastics
- C. Cable works
- D. Tire Plant
- E. Furniture Combine
- F. Military Motor Pool
- G. Bread factory
- H.Repairshop for motorcars and vulcanization shop
- I. Tobacco factory
- K. Soap Factory, Chemical Plant

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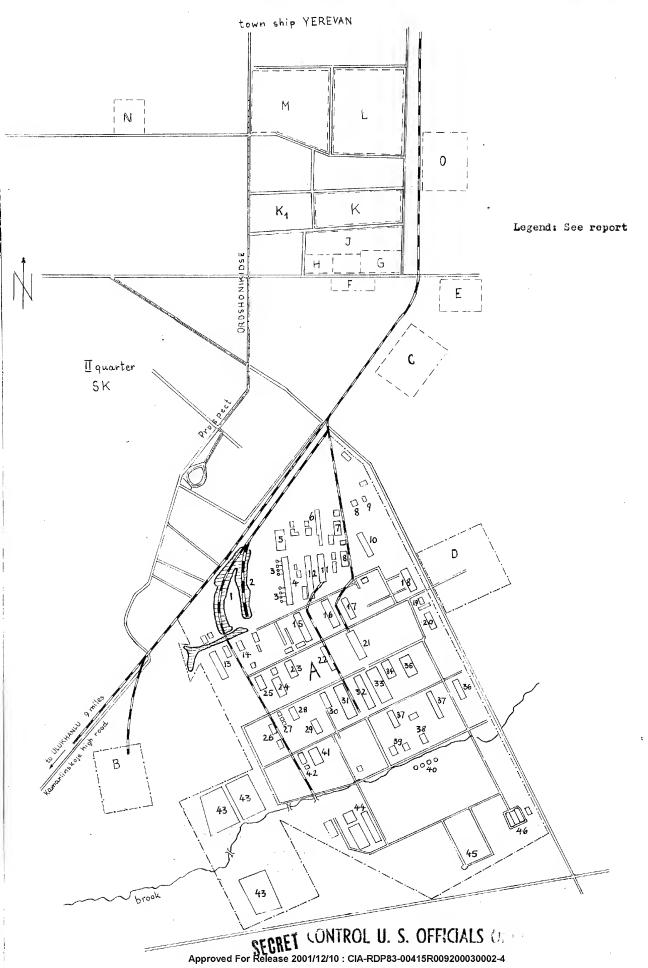
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Annex 3 to Approved For Release 2001/12/10: CIA-RDP83-00415R009200030002-4 Layout of the YEREVAN Rubber and Carbide Combine

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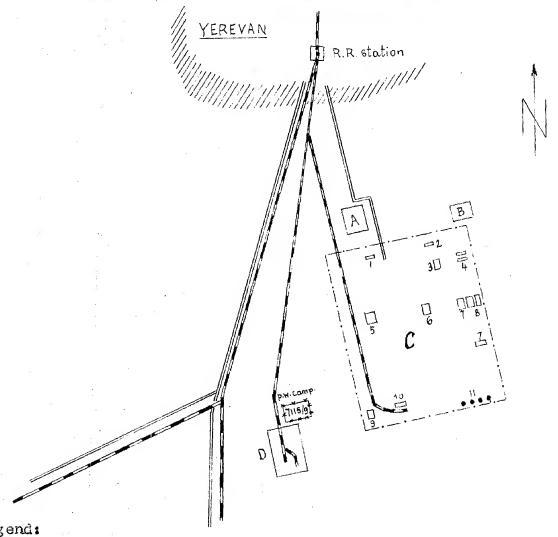
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Map Sketch of the TEREVAN Rubber Combine



Legend:

- Cable works
- Tire plant
- "Soveren No. 1" Rubber Plant
  - Administration building
  - First aid station
  - Dopot
  - Cooling installation
  - Carbide workshop
  - Boilerhouse with smokestack
  - Two rubber-producing workshops
  - Hydrogenation installation (? according to designation of source)
  - Probably calcralkali-electrolysis
  - 10 Acetylene generators
  - 11 Casometer
- Plant producing plastics

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